

TABLE 6-continued

Emulsifier System	Percent	Reconstituted Emulsion Stability 72 hrs. at 40° F.	Whitening Capability	Oiling	Feathering
Sodium stearyl-2-lactylate	.73	8+	9	9	9
Stearyl monoglyceridyl citrate	3.47	8	8	10	9
SYSTEM L					
Sodium stearyl-2-lactylate	.365	9+	10	10	10
DATEM	.574				
Controls					
Sodium stearyl-2-lactylate	.730	9	8+	9	9
DATEM	1.150	8+	8	8	9

¹DATEM refers to diacetyl tartaric acid esters of mono- and mono-diglycerides

²Same overall formula except 3% less oil used with 3% extra corn syrup

A review of Table 6 will illustrate the synergistic effect achieved using the preferred emulsifier systems of the invention. For example, in System A the controls gave respective test scores which were closely similar; yet when the amounts of these controls were halved and used in combination, the expected results (i.e., test scores which were an average of the control scores) were surpassed. This same pattern is followed throughout the data, thus unequivocally establishing the synergistic effect.

EXAMPLE VI

U.S. Pat. No. 3,695,889 describes a liquid non-dairy product containing polyunsaturated fat. This patent does not describe a dried product; however, in order to demonstrate that the liquid products of this patent cannot be simply dried to give an acceptable product, the following test was undertaken.

Example 2, column 4, lines 40-62 of U.S. Pat. No. 3,695,889 was repeated as follows:

Ingredients	Percent	Grams
Water	86.60	8660
Dipotassium phosphate	0.20	20
Sodium caseinate	1.60	160
Sucrose	1.00	100
Polysorbate 60	0.15	15
Sodium stearyl-2-lactylate	0.15	15
Propylene glycol monostearate	0.30	30
Soybean oil (P/S ratio 2.9)	10.00	1000
	100.00	100.00

The dipotassium phosphate, sodium caseinate, sucrose, polysorbate 60, stearyl lactylate, and propylene glycol monostearate were added to the water and mixed in a Groen stainless steel jacketed mixing vessel at room temperature. The vegetable oil was then added and all the ingredients were thoroughly dispersed. With continued stirring the mixture was then heated and pasteurized at 175° F., homogenized through a Gaulin homogenizer at an approximate temperature of 160° F. and a pressure of 3000 p.s.i.g. The resultant product was spray dried in an Anhydro laboratory spray dryer. An extremely low yield of a dry powdered product resulted because of product adherence to the sides of the dryer.

The functional stability of this product was determined by means of the Whitening Capability test described above. Three grams of the dried composition was stirred into 150 mls. of 175° F. black coffee. A 50 ml. aliquot was transferred to an Agtron Model M-500A reflectometer sample cup and relative spectral reflectance was measured in the red spectral mode. A value of eleven was observed. A minimum spectral reflectance of at least fifty is required for a product to be

acceptable. In fact, the powder lightened coffee only slightly, resulting in a medium dark brown color. Substantial oiling, oil droplets too numerous to count, and excessive foaming were also observed.

It was concluded that the non-dairy cereal blend described in Example 2 U.S. Pat. No. 3,695,889 cannot be satisfactorily spray dried to give an acceptable product.

Having thus desired the invention what is claimed as new and desired to be secured by Letters Patent is:

1. A dried, solid, liquid fat-containing coffee whitener or liquid dairy product replacement food particle, comprising:

a particle of fat having a diameter of no more than about 3 microns, said fat being flowable at about room temperature; and

an encapsulating matrix around said fat particle including at least one emulsifier and a carbohydrate material with a D.E. ranging from 10 to 70 selected from the group consisting of corn syrup, wheat syrup, sorghum syrup, the maltodextrins of the aforementioned syrups, and mixtures thereof, a plurality of said food particles having stability such that:

A. a 25% by volume dispersion thereof in water, when stored at 40° F. for 72 hours, exhibits no more than about 20% fat-water phase separation;

B. a quantity of said particles sufficient to provide a total of about 0.36 grams of fat, when dispersed in 50 mls. of black coffee at 175° F., gives a relative reflectance of at least 50%, using an Agtron Model M-500A reflectometer standardized in the red spectral mode, 640 m.u., with a 00 calibration disc for zero and a 44 calibration disc for 100% relative reflectance;

C. three grams of said food particles added to 150 mls. of 175° F. black coffee in a container having a 5 cm. diameter, followed by gentle stirring and allowing the mixture to stand for two minutes, exhibits no more than about 10 oil droplets on the surface of the mixture; and

D. taking the mixture derived from test (C) hereof, and allowing the same to stand for an additional 3 minutes, the mixture exhibits essentially no precipitation or flocculation, and no more than a moderate amount of feathering.

2. The food particle as set forth in claim 1 wherein said fat has a melting point of no more than about 90° F.

3. The food particle as set forth in claim 1 wherein said fat particle has a diameter of less than about 1 micron.

4. The food particle as set forth in claim 1 wherein said fat is taken from the group consisting of cottonseed,